

IN THE CLAIMS:

The status of each claim that has been introduced in the above-referenced application is identified in the ensuing listing of the claims. This listing of the claims replaces all previously submitted claims listings.

1. (Original) A method for insulating at least one aperture formed through a substrate, comprising:
introducing a quantity of unconsolidated dielectric material into the at least one aperture; and
selectively consolidating unconsolidated dielectric material located adjacent to a periphery of the
at least one aperture to form an insulative coating on surfaces of the at least one aperture.
2. (Currently Amended) The method of claim 1, wherein ~~said~~ introducing comprises
introducing a quantity of unconsolidated UV-curable dielectric material into the at least one
aperture.
3. (Currently Amended) The method of claim 2, wherein ~~said~~ selectively
consolidating comprises exposing portions of ~~said~~the unconsolidated UV-curable dielectric
material to UV radiation in the form of a laser beam.
4. (Currently Amended) The method of claim 1, wherein ~~said~~ introducing comprises
dispensing ~~said~~the quantity of unconsolidated dielectric material into the at least one aperture.
5. (Currently Amended) The method of claim 1, wherein ~~said~~ introducing comprises
lowering a level of the substrate relative to a level of a volume of ~~said~~the unconsolidated
dielectric material.
6. (Currently Amended) The method of claim 1, wherein ~~said~~ selectively
consolidating comprises directing an energy beam onto selected regions of ~~said~~the quantity of
unconsolidated dielectric material.

7. (Currently Amended) The method of claim 1, further comprising:
repeating ~~said~~ introducing and ~~said~~ selectively consolidating at least once to form another layer
of ~~said~~the insulative coating.
8. (Original) The method of claim 1, further comprising:
removing unconsolidated dielectric material remaining within the at least one aperture.
9. (Currently Amended) The method of claim 8, wherein, upon ~~said~~ removing, a via
hole that extends through ~~said~~the insulative coating is exposed.
10. (Currently Amended) A method for forming electrically conductive vias through
a substrate, comprising:
forming at least one precursor hole through the substrate;
introducing unconsolidated dielectric material into ~~said~~the at least one precursor hole; and
selectively consolidating portions of ~~said~~the unconsolidated dielectric material at locations
adjacent to a periphery of ~~said~~the at least one precursor hole to form a layer of an
insulative coating on surfaces of ~~said~~the at least one precursor hole.
11. (Currently Amended) The method of claim 10, wherein ~~said~~ forming comprises
forming ~~said~~the at least one precursor hole to have one of a substantially cylindrical shape, a
substantially frustoconical shape, an hourglass shape, and a bulging center.
12. (Currently Amended) The method of claim 10, wherein ~~said~~ forming includes
drilling through the substrate.
13. (Currently Amended) The method of claim 12, wherein ~~said~~ forming further
includes trepanning the substrate.

14. (Currently Amended) The method of claim 10, wherein ~~said~~ introducing comprises introducing an unconsolidated UV-curable dielectric material into ~~said~~the at least one precursor hole.

15. (Currently Amended) The method of claim 14, wherein ~~said~~ selectively consolidating comprises exposing portions of ~~said~~the UV-curable dielectric material to UV radiation in the form of a laser beam.

16. (Currently Amended) The method of claim 10, wherein ~~said~~ introducing comprises dispensing ~~said~~the unconsolidated dielectric material into ~~said~~the at least one precursor hole.

17. (Currently Amended) The method of claim 10, wherein ~~said~~ introducing comprises lowering a level of the substrate relative to a level of a volume of unconsolidated dielectric material.

18. (Currently Amended) The method of claim 10, wherein ~~said~~ selectively consolidating comprises directing an energy beam onto ~~said~~the portions of ~~said~~the unconsolidated dielectric material.

19. (Currently Amended) The method of claim 10, further comprising: repeating ~~said~~ introducing and ~~said~~ selectively consolidating at least once to form another layer of ~~said~~the insulative coating.

20. (Currently Amended) The method of claim 10, further comprising: removing unconsolidated dielectric material remaining within ~~said~~the at least one precursor hole.

21. (Currently Amended) The method of claim 20, wherein, upon ~~said~~ removing, a via hole that extends through ~~said~~the insulative coating is exposed.

22. (Currently Amended) The method of claim 21, further comprising:
introducing conductive material into ~~said~~the via hole.

23. (Currently Amended) The method of claim 22, wherein ~~said~~ introducing
conductive material comprises introducing at least one of polysilicon, a metal, a metal alloy, a
conductive elastomer, and a conductor-filled elastomer into ~~said~~the via hole.

24. (Currently Amended) The method of claim 22 wherein ~~said~~ introducing
conductive material comprises at least one of physical vapor depositing, chemical vapor
depositing, electrolytic plating, electroless plating, and immersion plating.

25. (Currently Amended) The method of claim 22, wherein ~~said~~ introducing
conductive material comprises dispensing ~~said~~the conductive material.

26. (Withdrawn and currently Amended) A semiconductor device structure,
comprising:
a substrate;
at least one aperture extending through ~~said~~the substrate; and
an insulative coating on each surface of ~~said~~the at least one aperture, comprising a plurality of
superimposed, contiguous, mutually adhered material layers, and forming a via hole
through ~~said~~the substrate.

27. (Withdrawn and currently Amended) The semiconductor device structure of
claim 26, wherein ~~said~~the insulative coating comprises polymer.

28. (Withdrawn and currently Amended) The semiconductor device structure of
claim 27, wherein ~~said~~the polymer comprises a UV-cured polymer.

29. (Withdrawn and currently Amended) The semiconductor device structure of claim 26, further comprising:

a conductive via within and extending through ~~said~~the via hole.

30. (Withdrawn and currently Amended) The semiconductor device structure of claim 29, wherein ~~said~~the conductive via comprises at least one of polysilicon, a metal, a metal alloy, a conductive elastomer, and a conductor-filled elastomer.

31. (Withdrawn and currently Amended) The semiconductor device structure of claim 26, comprising a plurality of apertures extending through ~~said~~the substrate, each aperture of ~~said~~the plurality of apertures being lined with an insulative coating comprising polymer.

32. (Withdrawn and currently Amended) A system for forming conductive vias through substrates, comprising:
an aperture-forming element configured to form at least one precursor hole in a substrate;
a dielectric material-introducing element configured to introduce unconsolidated dielectric material into ~~said~~the at least one precursor hole; and
a material consolidation element configured to selectively consolidate unconsolidated dielectric material located adjacent to a surface of ~~said~~the at least one precursor hole.

33. (Withdrawn and currently Amended) The system of claim 32, wherein ~~said~~the aperture-forming element comprises at least one of a router, a mechanical drill, and a laser drill.

34. (Withdrawn and currently Amended) The system of claim 32, wherein ~~said~~the aperture-forming element is configured to effect a trepanning process.

35. (Withdrawn and currently Amended) The system of claim 32, wherein ~~said~~the dielectric material-introducing element is configured to dispense ~~said~~the unconsolidated dielectric material into ~~said~~the at least one precursor hole.

36. (Withdrawn and currently Amended) The system of claim 32, wherein ~~said~~the dielectric material-introducing element comprises a fabrication tank of a stereolithography apparatus.

37. (Withdrawn and currently Amended) The system of claim 32, wherein ~~said~~the material consolidation element comprises a source of an energy beam.

38. (Withdrawn and currently Amended) The system of claim 37, wherein ~~said~~the source comprises a laser.

39. (Withdrawn and currently Amended) The system of claim 38, wherein ~~said~~the laser is configured to generate a UV laser beam.

40. (Withdrawn and currently Amended) The system of claim 32, further comprising: an unused material-removal element configured to remove unconsolidated dielectric material from ~~said~~the at least one precursor hole following use of ~~said~~the material consolidation element.

41. (Withdrawn and currently Amended) The system of claim 32, further comprising: a conductive material introduction element.

42. (Withdrawn and currently Amended) The system of claim 41, wherein ~~said~~the conductive material introduction element is configured to dispense conductive material into a via hole that extends through an insulative coating formed by selectively consolidated insulative material.

43. (Withdrawn and currently Amended) The system of claim 41, wherein ~~said~~the conductive material introduction element comprises at least one of a physical vapor deposition

chamber, a chemical vapor deposition chamber, an electrolytic plating bath, and an electroless or immersion plating bath.

44. (Withdrawn and currently Amended) A surface level control system for a stereolithographic fabrication tank, comprising:
at least one aperture defined through a side wall of the stereolithographic fabrication tank; and
at least one receptacle for receiving unconsolidated material from the stereolithographic fabrication tank in communication with ~~said~~the at least one aperture.

45. (Withdrawn and currently Amended) The surface level control system of claim 44, wherein ~~said~~the at least one aperture is configured and located so as to remove a displaced volume of ~~said~~the unconsolidated material from the stereolithographic fabrication tank.

46. (Withdrawn and currently Amended) The surface level control system of claim 44, wherein a bottom edge of ~~said~~the at least one aperture is located at an elevation on ~~said~~the side wall which is at about a desired location of a surface level of ~~said~~the unconsolidated material within the stereolithographic fabrication tank.

47. (Withdrawn and currently Amended) The surface level control system of claim 44, further comprising:
a material recycling element in communication with ~~said~~the at least one receptacle and the stereolithographic fabrication tank and configured to transport material within ~~said~~the at least one receptacle into the stereolithographic fabrication tank.